

A comparison of dynamical evolution of atmospheric fields from different reanalysis using a Self Organizing Map

Rajib Chattopadhyay[†]; Chidong Zhang

[†]RSMAS, University of Miami, USA

Leading author: rajib@rsmas.miami.edu

This study utilizes a non-linear clustering technique based on Self Organizing Map (SOM) algorithm to identify the life cycle of the Madden Julian Oscillation (MJO) from different Reanalysis datasets. The SOM brings out committed spatial pattern directly to each phases of MJO life cycle (e.g. initiation, maturation, dissipation etc.). Also, the projected patterns capture the low-frequency MJO envelope that does not have any variance or harmonic truncation and require minimum degree of preprocessing. SOM can be also effectively used to isolate the pattern of the low frequency mode from a data with limited sample size where the other available techniques may not be efficient. Horizontal and vertical patterns of MJO are compared for fields like diabatic heating/moistening, wind, humidity, precipitation from different reanalysis data set like Modern ERA Retrospective Analysis, ECMWF interim Renalysis, TRMM precipitation with that of patterns derived based on standard Empirical Orthogonal Function representation.